

Radioactive Decay of Candium

Name: KEY Date: _____ Period: _____

Purpose: To simulate the nuclear decay of a radioisotope.

Materials:

candy pieces (M&M's, Skittles etc.)
resealable bag
clock

Procedure:

1. Place 50 atoms of candium (pieces of candy) in the bag.
2. Seal the bag and gently shake for 10 seconds.
3. Gently pour out candy.
4. Count the number of pieces with the print side up. These atoms have "decayed". Record this number in the data table.
5. Return only the pieces with the print side down to the bag. Reseal the bag.
6. Consume the "decayed" atoms.
7. Gently shake the sealed bag for 10 seconds.
8. Continue shaking, counting, and consuming until all the atoms have decayed.
9. Create a line graph of your data in the space provided.

Data:

Personal Data:

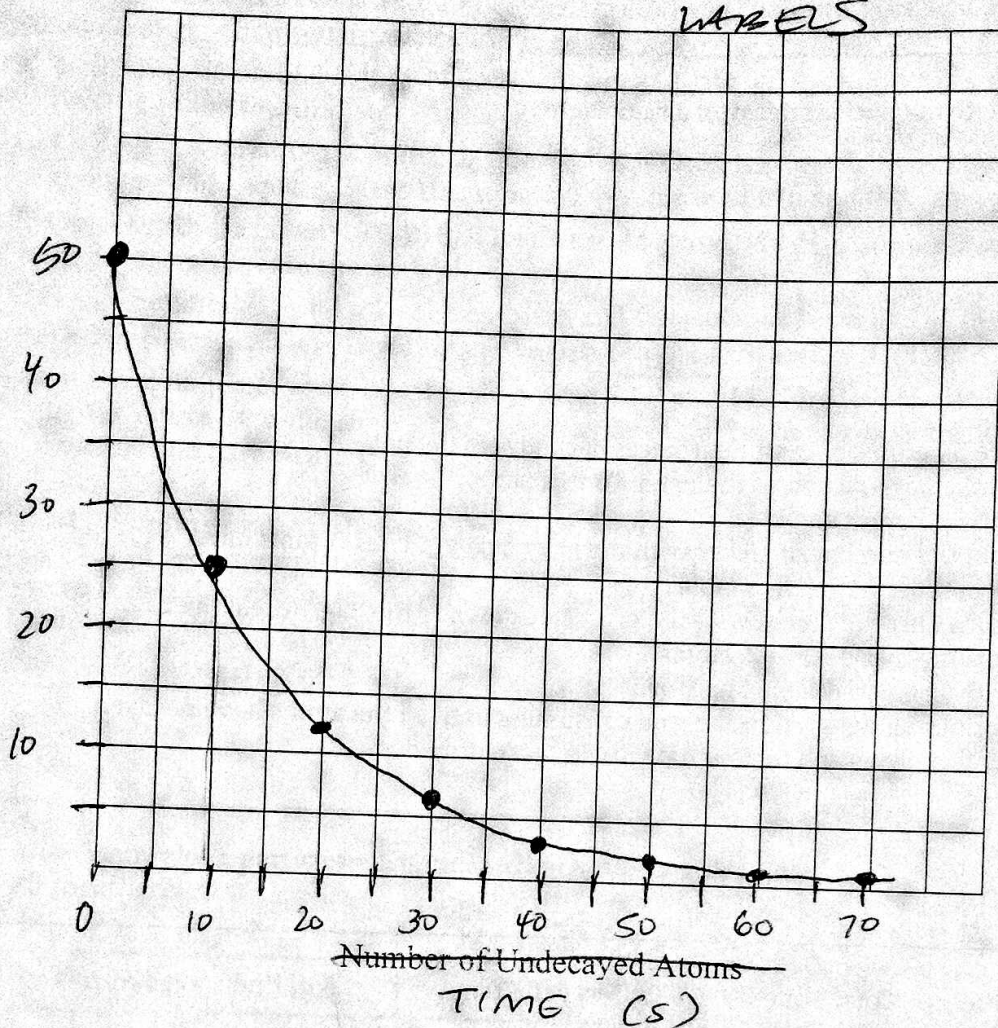
Half-life	Total Time	# of Decayed Atoms	# of Undecayed Atoms
0	0	0	50
1	10 sec	25	25
2	20 sec	12	13
3	30 sec	7	6
4	40 sec	3	3
5	50 sec	1	2
6	60 sec	1	1
7	70 sec	0	1

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Graph of Your Data:

HAVE STUDENTS CHANGE X/Y LABELS

AMT OF CANDIUM (PIECES) REMAINING
Number of Half Lives



Conclusion Questions:

1. Define half-life.

THE AMT OF TIME REQUIRED FOR $\frac{1}{2}$ A SUBSTANCE TO DECAY

2. Can you predict when an individual "candium" atom will decay?

NO

3. Is your graph of the class data a straight line? What does the shape of the line tell you about how a radioisotope decays?

NO, IT SHOWS THAT THE RELATIONSHIP BETWEEN TIME AND THE ISOTOPE REMAINING IS EXPONENTIAL

4. In the experiment what was the half-life of the element candium?

10 SECONDS

5. At the end of 2 half-lives what fraction of the atoms had not decayed?

$\frac{3}{4}$ DECAYED $\frac{1}{4}$ REMAINING